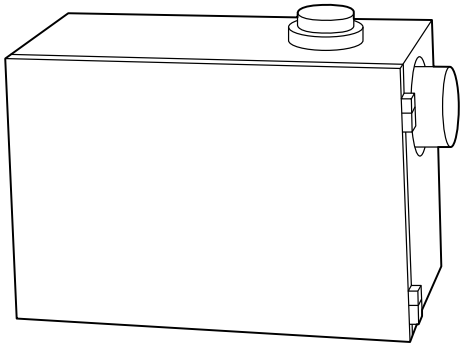
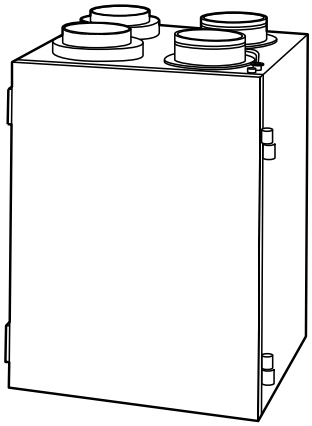
bryant
Heating & Cooling Systems

# HEAT RECOVERY VENTILATORS

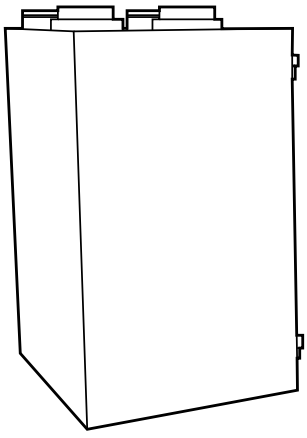
# MODELS VA3B, VB5B VC5B



**VA3B**



**VB5B**



**VC5B**

The Heat Recovery Ventilation (HRV) system offered by Bryant is the finest unit on the market today. The VA3B, VB5B, and VC5B provide efficient and cost-effective heat recovery during the heating season when needed most.

As temperatures drop below 23°F (–5°C), indoor air is recirculated periodically through the heat exchanger core to prevent frost from forming. Competitors' methods of supplementary electric defrost waste energy. Unlike rotary wheel heat exchangers which mix air streams, these cross flow or counterflow heat exchangers ensure that there is no mixing of the stale air stream with the fresh outdoor air stream.

A filter installed on the incoming outdoor air stream removes large airborne particles from the intake air stream before they enter the heat exchanger and reduces the maintenance required.

The units' acoustically engineered design makes them the quietest on the market and ensures that comfort is felt, not heard.

Unlatching 2 suitcase style latches allows easy removal of the filters and core for cleaning.

## FEATURES

- Energy saving defrost cycle
- Cross flow, counterflow heat exchangers
- Two filters on incoming outdoor air stream to protect the HRV core
- Acoustical design
- No-tools maintenance
- Polypropylene heat exchanger core

Form No. PDS VA3B.15.2

## MODEL NUMBER NOMENCLATURE

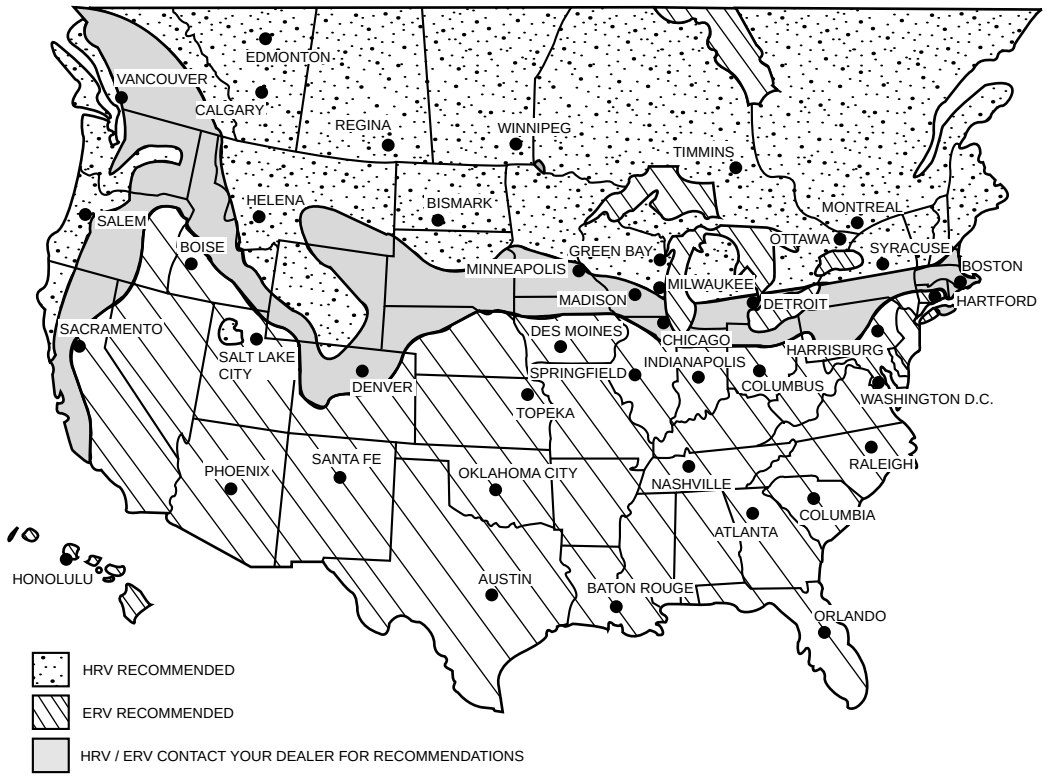
**V A 3 B A B 015**

- **015** — Maximum Capacity (CFM)
  - 015—(150 CFM)
  - 020—(200 CFM)
  - 027—(270 CFM)
- **B** — B—Defrost
- **A** — A—115-1-60
- **B** — B—Second Series
- **3** — 3—Horizontal
  5—Upflow/Downflow
- **A** — A—Conventional (RNC)
  B—Compact (Standard)
  C—High Efficiency (Deluxe)
- **V** — V—Heat Recovery Ventilator

TESTED/CERTIFIED

HOME VENTILATING INSTITUTE®
DIVISION OF AMCA

## CLIMATE MAP FOR ENERGY AND HEAT RECOVERY VENTILATORS




INFORMATION BASED ON AIRPORT 10-YEAR TEMPERATURE DATA & ARI HEATING AND COOLING LOAD HOURS

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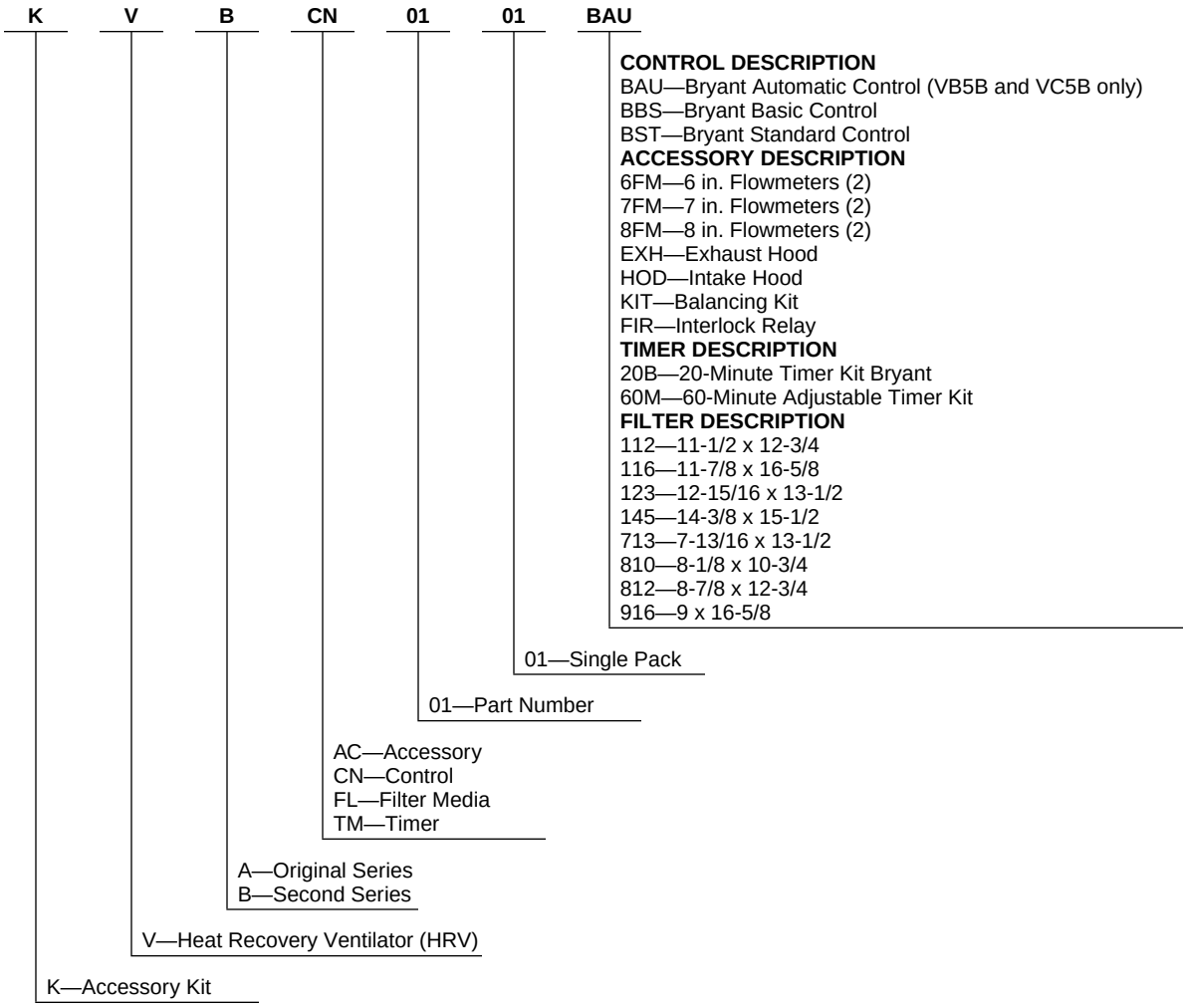
## CONTROLS AND ACCESSORIES PART NO. NOMENCLATURE




## ACCESSORIES

| Kit Number | Description | Where Used |
|---|---|---|
| KVBCN0101BBS | Basic HRV Control | Used with all HRVs |
| KVBCN0101BST | Standard HRV Control | Used with all HRVs |
| KVBCN0101BAU | Automatic HRV Control | Used with all VB5B and VC5B |
| KVAAC0101FIR | Interlock Relay | When combining an HRV with a Furnace or Fan Coil |
| KVATM010120B | 20 Minute Push Button Timer | Used with all HRVs when 20 minute manual operation is required |
| KVATM010160M | 60 Minute Timer | Used with all HRVs, time is adjustable between 10 and 60 minutes |
| KVAAC0101HOD | Exterior Intake and Exhaust Hood | 2 Required, 1 for intake and 1 for exhaust on all models except VA3B |
| KVAAC0101EXH | Exterior Exhaust Hood | 1 Required on VA3B models to prevent backflow along with 1 KVAAC0101HOD for intake |
| KVAAC0101KIT | Start up Balancing Kit | Start up Balancing Kit, includes (2) 6 in. Flow Meter Collars & Magnehelic Gage |
| KVAAC01016FM | 6 in. Flow Meter Collar | At start up, when 6 in. duct work is connected to HRV |
| KVAAC01017FM | 7 in. Flow Meter Collar | At start up, when 7 in. duct work is connected to HRV |
| KVAAC01018FM | 8 in. Flow Meter Collar | At start up, when 8 in. duct work is connected to HRV |
| KVAFL0101112 | Internal Metal Filter | Used on VA3B015 Size Unit, 11-1/2 in. x 12-3/4 in., 1 per unit |
| KVAFL0101812 | Internal Metal Filter | Used on VA3B015 Size Unit, 8-7/8 in. x 12-3/4 in., 1 per unit |
| KVAFL0101116 | Internal Metal Filter | Used on VA3B020 Size Unit, 11-7/8 in. x 16-5/8 in., 1 per unit. |
| KVAFL0101916 | Internal Metal Filter | Used on VA3B020 Size Unit, 9 in. x 16-5/8 in., 1 per unit |
| KVAFL0101123 | Internal Metal Filter | Used on VC5B015 Size Unit, 12-15/16 in. x 13-1/2 in., 1 per unit |
| KVAFL0101145 | Internal Metal Filter | Used on VC5B020 VC5B027 Size Units, 14-3/8 in. x 15-1/2 in., 1 per unit |
| KVAFL0101713 | Internal Metal Filter | Used on VB5B015 Size Unit, 7-13/16 in. x 13-1/2 in., 2 per unit |
| KVAFL0101810 | Internal Metal Filter | Used on VC5B020 VC5B027 Size Units, 8-1/8 in. x 10-3/4 in., 1 per unit |

## CONTROL FEATURES

**Basic Control:** Allows the user to manually set fan speed to low or high as required to maximize comfort.

**Standard Control:** Offers automatic dehumidistat control and the option to select continuous or intermittent fan operation.

**Automatic Control:** In addition to features found with the standard control, this package offers a recirculation mode. This control may be used with stand alone versions of the VB5B and VC5B only.

| CONTROL DESCRIPTION | FAN SPEED CONTROL | DEHUMIDISTAT CONTROL | CONTINUOUS MODE* | INTERMITTENT MODE* | CIRCULATION MODE† |
|---|---|---|---|---|---|
| Basic | Yes | No | Yes | No | No |
| Standard | Yes | Yes | Yes | Yes | No |
| Automatic‡ | Yes | Yes | Yes | Yes | Yes |

* Air exchange with outside.
† No air exchange with outside.
‡ Use only on units with defrost.

## CONTROL DESCRIPTION AND USAGE

**Fan Speed Control**—Enables user to modulate fan speed from low to high air exchange with outside.

**Dehumidistat Control**—Allows the user to select the relative humidity level at which the unit would change fan speed for dehumidification in the winter months.

**Continuous Mode**—If the relative humidity inside the building is lower than selected, air exchange occurs with the outside air at low speed. If the relative humidity inside the house is higher than selected, air exchange occurs with the outside air at high speed. Ensures continuous air exchange for constant air quality.

**Intermittent Mode**—If the relative humidity inside the building is lower than selected, no air exchange occurs and the system turns off. If the relative humidity inside the house is higher than selected, air exchange occurs with the outside at high speed. Ensures minimum air exchange level when the building is unoccupied to minimize operating costs.

**Circulation Mode**—If the relative humidity inside the building is lower than selected, the ambient air is circulated and filtered at high speed. If the relative humidity inside the house is higher than selected, air exchange occurs with the outside air at high speed. Ensures continuous movement and filtration of air for maximum comfort. Available with automatic control only.

## AUTOMATIC DEFROST CYCLE FEATURES

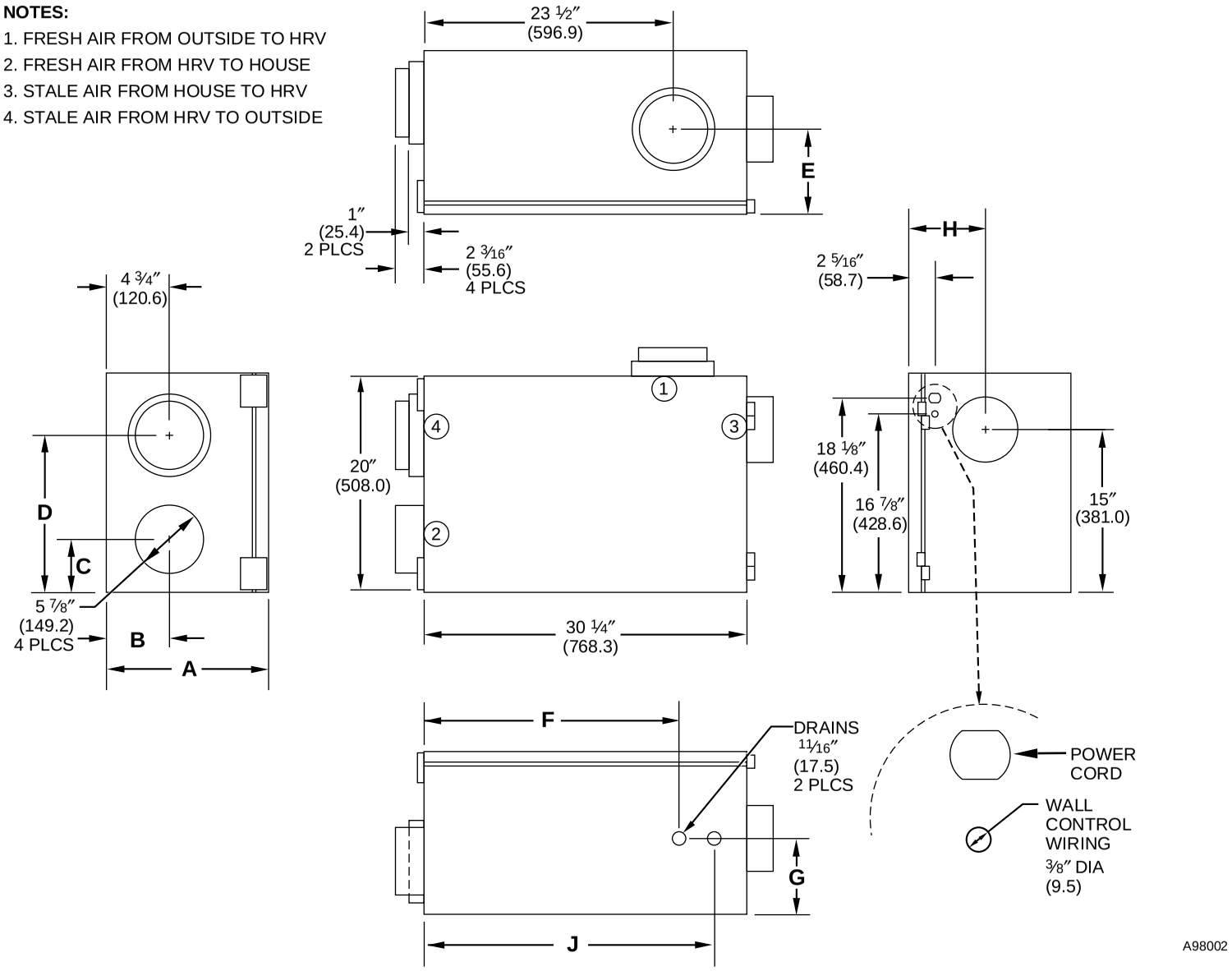
All models offer a non-electric defrost cycle feature which prevents frost and ice buildup within the heat recovery core. When the outside air temperature falls below 23°F (–5°C) it is electronically sensed and the dampers close the outside air ports. This allows warm indoor air to recirculate within the heat recovery core. The frequency of this cycle increases as the outside air temperature decreases.

| | 23°F TO 5°F (–5°C TO –15°C) | | 5°F TO –22°F (–15°C TO –30°C) | | BELOW –22°F (–30°C) | |
|---|---|---|---|---|---|---|
| MODEL | DEFROST* | EXCHANGE† | DEFROST* | EXCHANGE† | DEFROST* | EXCHANGE† |
| VA3BAB | 5 Minutes | 60 Minutes | 5 Minutes | 35 Minutes | 5 Minutes | 20 Minutes |
| VB5BAB | 5 Minutes | 60 Minutes | 5 Minutes | 35 Minutes | 5 Minutes | 20 Minutes |
| VC5BAB | 6 Minutes | 60 Minutes | 6 Minutes | 35 Minutes | 6 Minutes | 20 Minutes |

* Length of defrost time
† Time between defrost when within specified temperature range

**NOTES:**

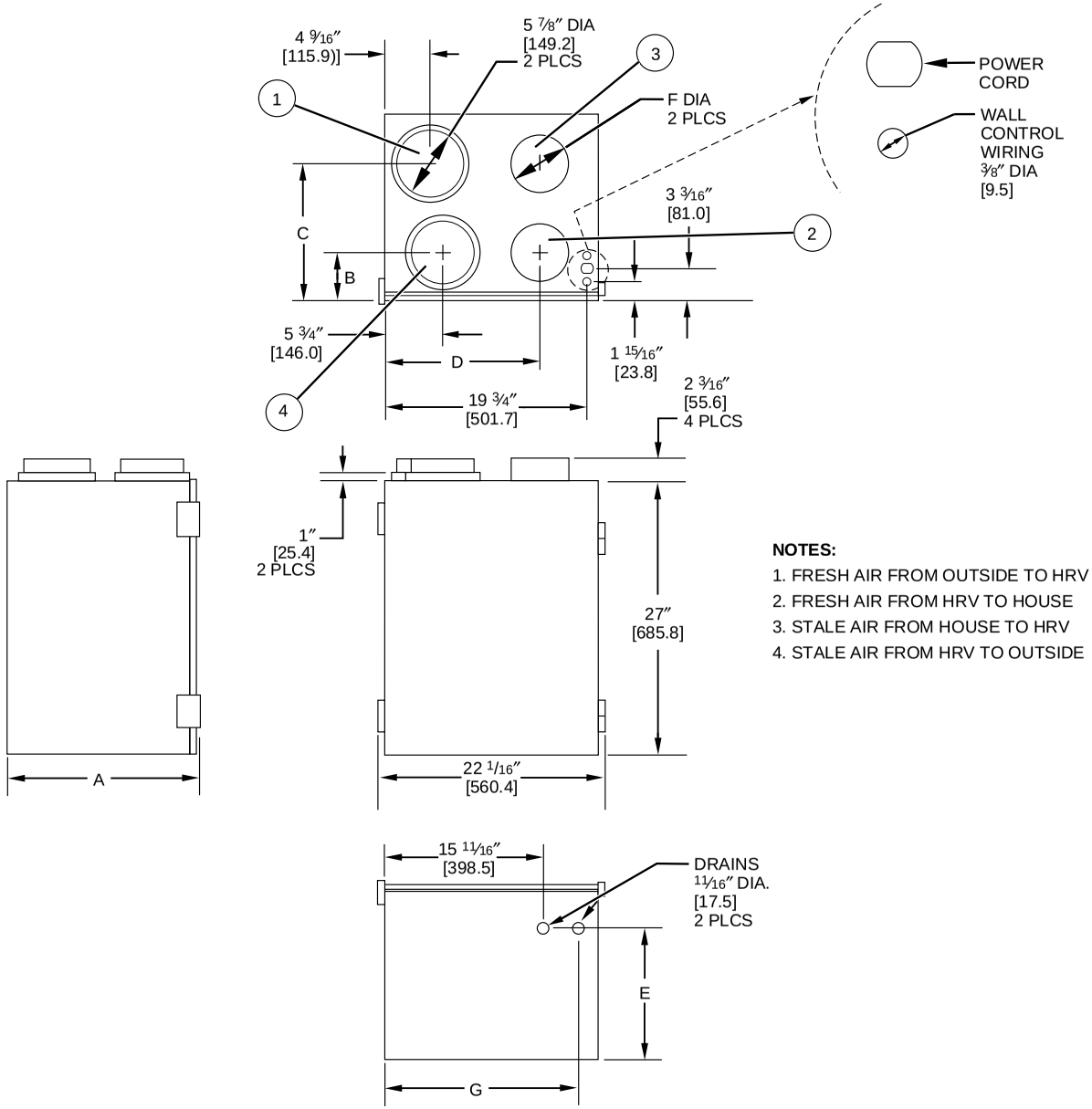
1. FRESH AIR FROM OUTSIDE TO HRV
2. FRESH AIR FROM HRV TO HOUSE
3. STALE AIR FROM HOUSE TO HRV
4. STALE AIR FROM HRV TO OUTSIDE






## DIMENSIONS

| | A | | B | | C | | D | | E | | F | | G | | H | | J | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MODEL NO. | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm |
| VA3BAB015 | 15-3/16 | 385.8 | 4-3/4 | 120.6 | 5-1/8 | 130.2 | 14-3/4 | 374.6 | 7-5/8 | 193.6 | 20-3/8 | 517.5 | 7-5/16 | 185.7 | 7-3/4 | 196.8 | 27 | 685.8 |
| VA3BAB020 | 18-7/8 | 479.4 | 13-1/2 | 342.9 | 5-7/8 | 149.2 | 14 | 355.6 | 10 | 254.0 | 15-13/16 | 401.6 | 9-5/16 | 236.6 | 8-13/16 | 223.8 | 27 | 685.8 |




**NOTES:**

1. FRESH AIR FROM OUTSIDE TO HRV
2. FRESH AIR FROM HRV TO HOUSE
3. STALE AIR FROM HOUSE TO HRV
4. STALE AIR FROM HRV TO OUTSIDE

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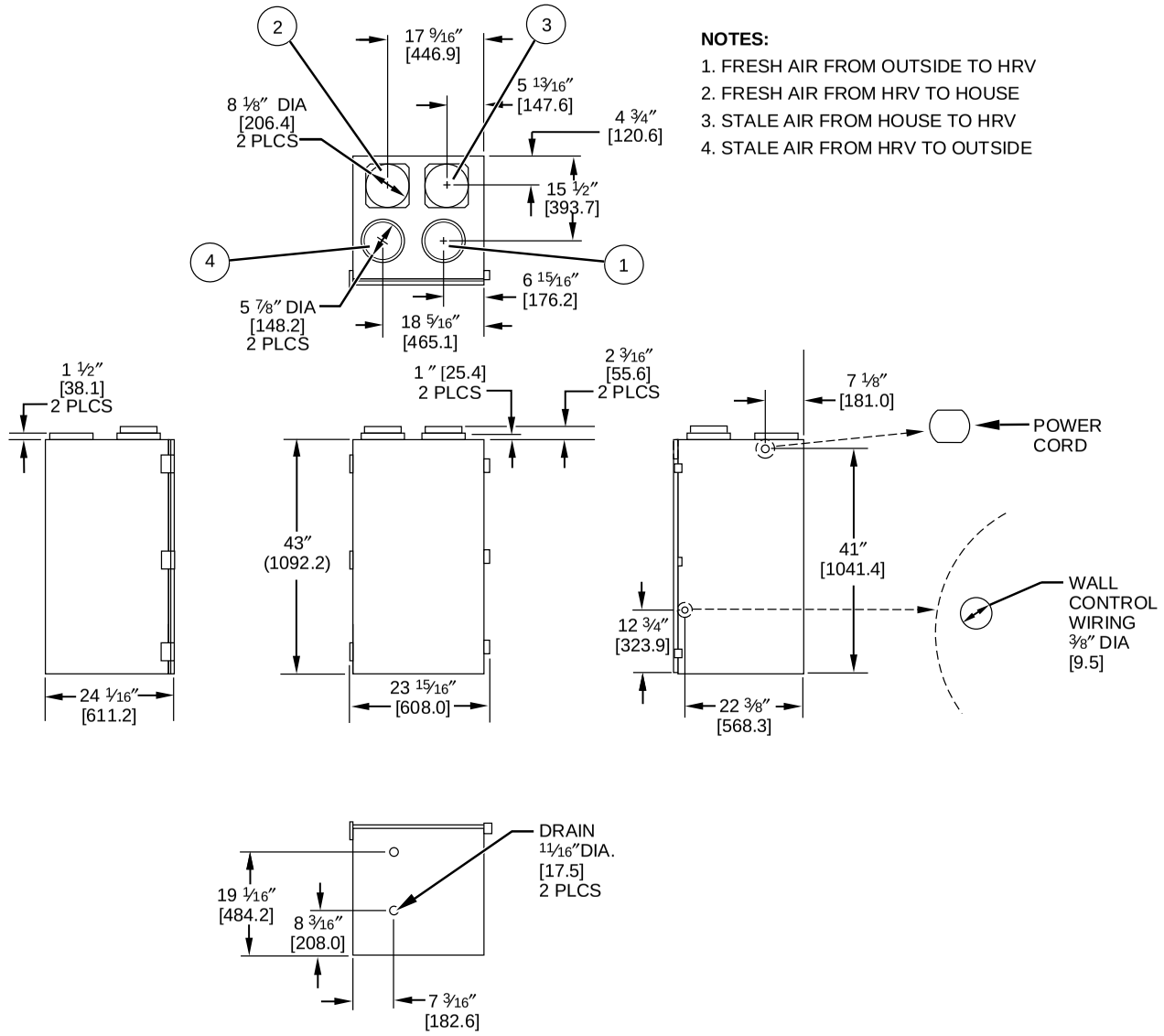
## DIMENSIONS

| | A | | B | | C | | D | | E | | F | | G | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MODEL NO.** | **in.** | **mm** | **in.** | **mm** | **in.** | **mm** | **in.** | **mm** | **in.** | **mm** | **in.** | **mm** | **in.** | **mm** |
| VB5BAB015 | 18-1/2 | 469.9 | 4-11/16 | 119.1 | 13-5/16 | 388.2 | 15-7/16 | 392.1 | 13-9/16 | 344.5 | 5-7/8 | 149.2 | 19-15/16 | 506.2 |
| VB5BAB020<br>VC5BAB015 | 24-1/2 | 622.2 | 8-3/16 | 208.0 | 19-5/16 | 490.6 | 14-9/16 | 369.9 | 16-15/16 | 430.2 | 6-7/8 | 174.6 | 19-15/16 | 506.2 |




**NOTES:**

1. FRESH AIR FROM OUTSIDE TO HRV
2. FRESH AIR FROM HRV TO HOUSE
3. STALE AIR FROM HOUSE TO HRV
4. STALE AIR FROM HRV TO OUTSIDE

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**VC5BAB020 or VC5BAB027**

## SPECIFICATIONS

| MODEL | CONVENTIONAL | | COMPACT | | HIGH EFFICIENCY | | |
|---|---|---|---|---|---|---|---|
| | VA3BAB015 | VA3BAB020 | VB5BAB015 | VB5BAB020 | VC5BAB015 | VC5BAB020 | VC5BAB027 |
| Capacity—CFM @ 0.5–0.3 ESP (in. wc) | 130–168 | 191–210 | 106–150 | 177–217 | 123–141 | 189–209 | 300–334 |
| Port Locations | Top and Sides | Top and Sides | Top | Top | Top | Top | Top |
| Core Type | Polypropylene Cross Flow | Polypropylene Cross Flow | Polypropylene Cross Flow | Polypropylene Cross Flow | Polypropylene Cross Flow | Polypropylene Counterflow | Polypropylene Counterflow |
| Weight—lb (kg) | 60 (27) | 80 (36.6) | 60 (27) | 80 (36.3) | 80 (36.3) | 120 (54.5) | 120 (54.5) |
| Shipping Wt—lb (kg) | 67 (30.4) | 85 (38.5) | 75 (34) | 89 (40.4) | 89 (40.4) | 143 (64.9) | 143 (64.9) |
| Shipping Dimensions (in.)<br>Height<br>Width<br>Depth | <br>21.00<br>35.5<br>19.75 | <br>21.00<br>35.5<br>19.75 | <br>31.5<br>23.25<br>26.00 | <br>31.5<br>23.25<br>26.00 | <br>31.5<br>23.25<br>26.00 | <br>47.5<br>26.0<br>26.0 | <br>47.5<br>26.0<br>26.0 |
| **AIRFLOW PERFORMANCE** | | | | | | | |
| Capacity—CFM @ 0.5–0.3 ESP (in. wc) | 130–168 | 191–210 | 106–150 | 177–211 | 123–141 | 189–209 | 300–334 |
| Efficiency (Sensible)—percent<br>95°F (35°C)<br>32°F (0°C)<br>–13°F (–25°C) | <br>27<br>76<br>56 | <br>22<br>68<br>61 | <br>19<br>69<br>60 | <br>23<br>77<br>67 | <br>27<br>81<br>69 | <br>23<br>84<br>72 | <br>22<br>80<br>74 |
| Efficiency (Latent)—percent<br>@ all temperatures | <br>0 | <br>0 | <br>0 | <br>0 | <br>0 | <br>0 | <br>0 |
| Heat Core Exchange Area—cu ft (cu m) | 120 (11.2) | 160 (14.9) | 90 (8.4) | 144 (13.3) | 144 (13.3) | 210 (19.5) | 210 (19.5) |
| **ELECTRICAL DATA** | | | | | | | |
| Voltage | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| Max Power—watts | 105 | 218 | 115 | 195 | 115 | 250 | 500 |
| Max Amps | 1.2 | 2.0 | 1.2 | 1.8 | 1.2 | 2.2 | 5.4 |

## METHODS TO SIZE HRV'S

**METHOD 1**

1. Calculate cu ft of occupied space.
2. Multiply by recommended air changes per hr (AC/h).
3. Divide by 60 minutes per hr to convert to CFM.

**EXAMPLE:** 2000 sq ft with 8 ft ceiling
0.35 air changes per hr (AC/h)

(2000 sq ft x 8 ft ceiling x 0.35 AC/h) / 60 min/h = 93.3 CFM

**METHOD 2**

1. Multiply number of people times 15 CFM/person.
2. Multiply number of bath rooms 20 CFM/each.
3. Add 25 CFM for kitchen.

**EXAMPLE:** 2 people
2 baths
1 kitchen

(2 x 15) + (2 x 20) + 25 = 95 CFM

## ADDITIONAL HEATING AND COOLING LOAD CHARTS

Although the ventilators process the outside air before it enters the home, additional heating and cooling loads need to be considered.

## HEATING LOAD BTU

| Outside Temp °F | Heat Load (Btuh) @ Inside Design Temp 72°F | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | VA3BAB015 | VA3BAB020 | VB5BAB015 | VB5BAB020 | VC5BAB015 | VC5BAB020 | VC5BAB027 | VL3AAA015* | VL3AAA020* |
| –25 | 7,990 | 9,290 | 6,970 | 7,690 | 5,500 | 6,650 | 9,990 | — | — |
| –20 | 7,260 | 8,630 | 6,470 | 7,090 | 5,030 | 6,070 | 9,310 | — | — |
| –15 | 6,570 | 7,990 | 5,990 | 6,520 | 4,590 | 5,510 | 8,650 | — | — |
| –13 | 6,300 | 7,730 | 5,800 | 6,300 | 4,410 | 5,290 | 8,390 | — | — |
| –10 | 5,910 | 7,360 | 5,520 | 5,970 | 4,160 | 4,970 | 8,000 | — | — |
| –5 | 5,280 | 6,760 | 5,070 | 5,440 | 3,750 | 4,470 | 7,380 | — | — |
| 0 | 4,600 | 6,060 | 4,550 | 4,840 | 3,300 | 3,910 | 6,640 | — | — |
| 5 | 4,050 | 5,510 | 4,130 | 4,360 | 2,940 | 3,470 | 6,060 | — | — |
| 10 | 3,540 | 4,980 | 3,730 | 3,900 | 2,600 | 3,050 | 5,500 | — | — |
| 15 | 3,010 | 4,380 | 3,290 | 3,400 | 2,240 | 2,600 | 4,870 | 3,170 | 4,730 |
| 20 | 2,570 | 3,900 | 2,930 | 3,000 | 1,940 | 2,240 | 4,350 | 2,890 | 4,320 |
| 25 | 2,170 | 3,440 | 2,580 | 2,610 | 1,670 | 1,910 | 3,850 | 2,610 | 3,900 |
| 30 | 1,800 | 2,990 | 2,240 | 2,250 | 1,410 | 1,600 | 3,370 | 2,330 | 3,490 |
| 32 | 1,640 | 2,780 | 2,090 | 2,080 | 1,300 | 1,460 | 3,140 | 2,200 | 3,280 |
| 35 | 1,440 | 2,530 | 1,900 | 1,880 | 1,160 | 1,300 | 2,870 | 2,030 | 3,040 |
| 40 | 1,140 | 2,130 | 1,600 | 1,560 | 940 | 1,040 | 2,430 | 1,760 | 2,630 |

* See ERV Product Data for details.

The heating load chart shows the heating loads in Btuh for a range of winter design temperatures for each model of ventilator.

**EXAMPLE:** The heating design temperature for Milwaukee, WI is –4°F. At –5°F, the additional heating load of the VA3BAB020 is 6760 Btuh. This additional load should be taken into consideration when sizing the heating equipment.

## COOLING LOADS BTU

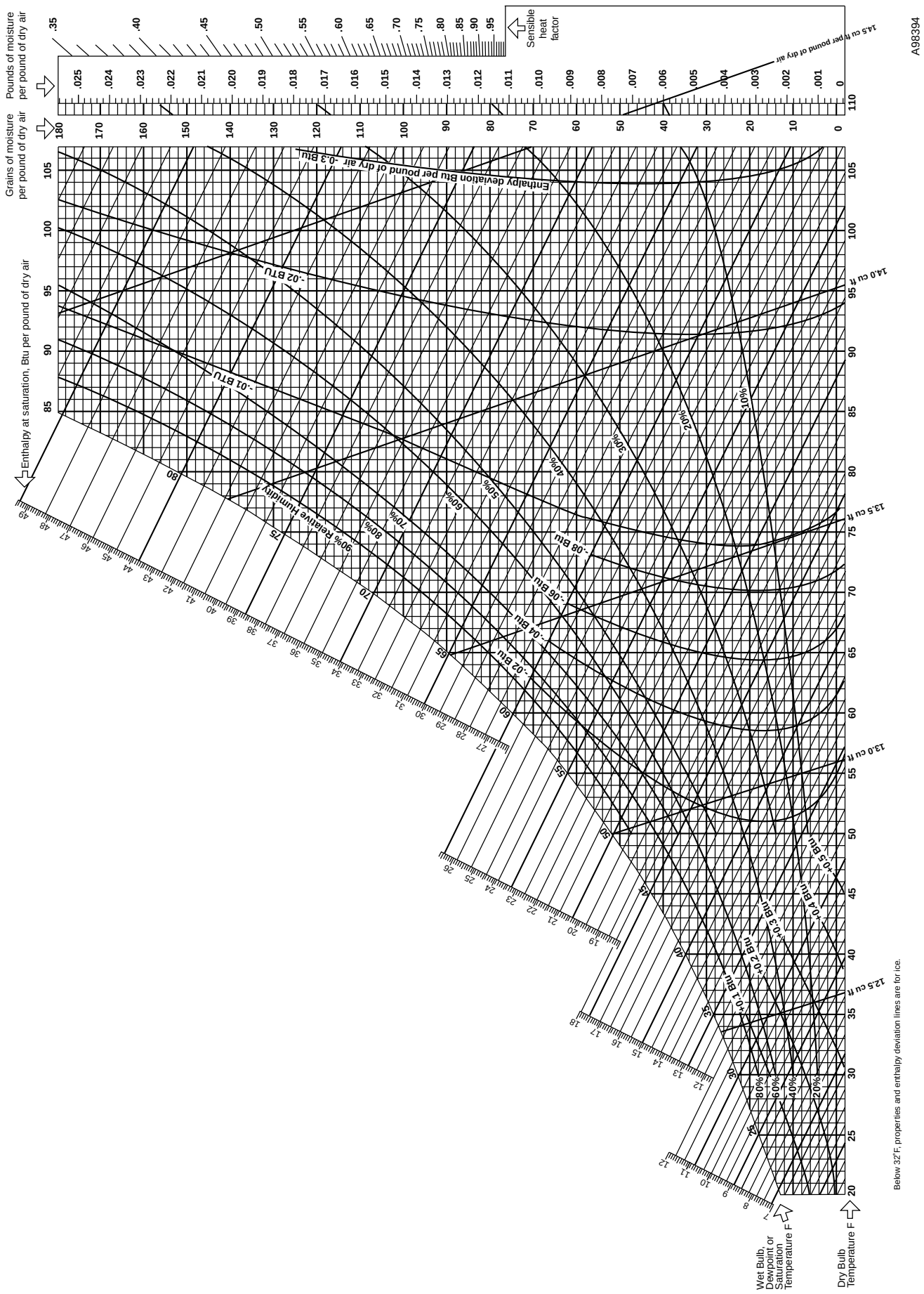
| Outside Enthalpy Btu/lb | Cooling Load (Btuh) @ Inside Design Temp 75°F and 50% Relative Humidity | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | VA3BAB015 | VA3BAB020 | VB5BAB015 | VB5BAB020 | VC5BAB015 | VC5BAB020 | VC5BAB027 | VL3AAA015* | VL3AAA020* |
| 30 | 700 | 1,020 | 780 | 990 | 770 | 990 | 1,390 | 550 | 800 |
| 31 | 1,170 | 1,690 | 1,300 | 1,650 | 1,290 | 1,650 | 2,310 | 920 | 1,330 |
| 32 | 1,640 | 2,370 | 1,820 | 2,310 | 1,800 | 2,310 | 3,240 | 1,280 | 1,860 |
| 33 | 2,110 | 3,050 | 2,340 | 2,970 | 2,310 | 2,970 | 4,170 | 1,650 | 2,390 |
| 34 | 2,580 | 3,720 | 2,860 | 3,630 | 2,830 | 3,630 | 5,090 | 2,020 | 2,920 |
| 35 | 3,050 | 4,400 | 3,380 | 4,290 | 3,340 | 4,290 | 6,020 | 2,380 | 3,450 |
| 36 | 3,520 | 5,080 | 3,910 | 4,950 | 3,860 | 4,950 | 6,940 | 2,750 | 3,990 |
| 37 | 3,990 | 5,760 | 4,430 | 5,610 | 4,370 | 5,610 | 7,870 | 3,110 | 4,520 |
| 38 | 4,460 | 6,430 | 4,950 | 6,270 | 4,890 | 6,270 | 8,790 | 3,480 | 5,050 |
| 39 | 4,930 | 7,110 | 5,470 | 6,930 | 5,400 | 6,930 | 9,720 | 3,850 | 5,580 |
| 40 | 5,400 | 7,790 | 5,990 | 7,590 | 5,910 | 7,590 | 10,650 | 4,210 | 6,110 |
| 41 | 5,870 | 8,460 | 6,510 | 8,250 | 6,430 | 8,250 | 11,570 | 4,580 | 6,640 |
| 42 | 6,340 | 9,140 | 7,030 | 8,910 | 6,940 | 8,910 | 12,500 | 4,950 | 7,170 |

* See ERV Product Data for details.

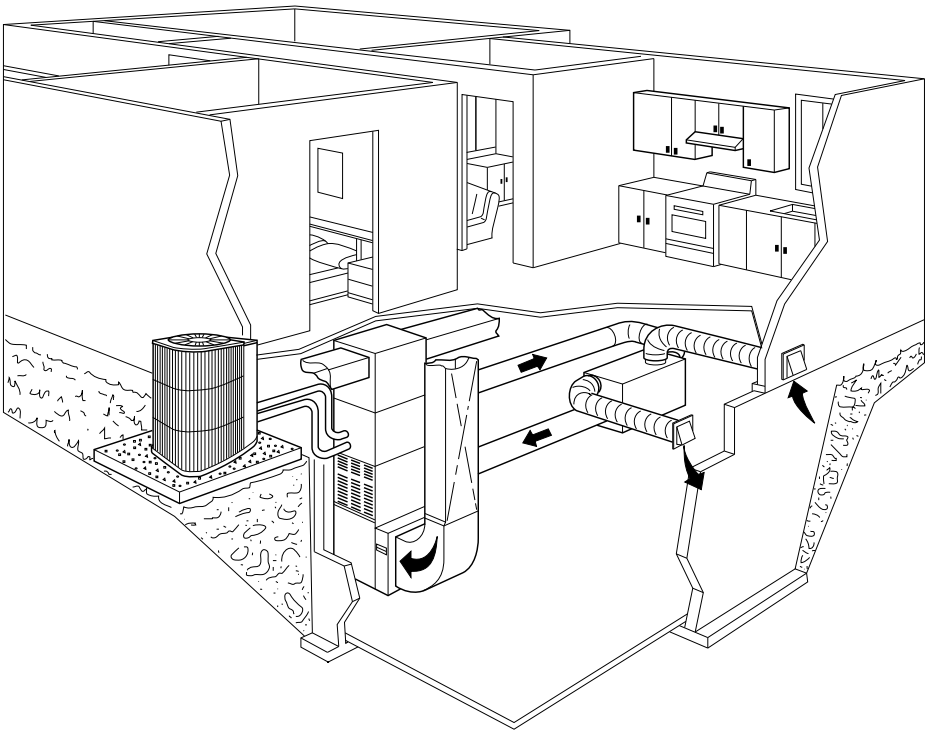
The cooling load chart shows loads in Btuh as well. To use the cooling load chart, first find the design enthalpy from a psychrometric chart using the design dry bulb and wet bulb temperatures. (See psychrometric chart on p. 11.) The cooling load can then be found for a range of enthalpies for each ventilator.

**EXAMPLE:** The cooling design dry bulb temperature for Milwaukee, WI is 87°F and the average wet bulb at that temperature is 73°F. On the psychrometric chart the enthalpy is about 37.7 Btu/lb of dry air which will round up to 38 Btu/lb of dry air. In the left column, at 38 Btu/lb the VA3BAB020 would have an additional cooling load of 6430 Btuh. This additional load should be taken into account when sizing the air cooling equipment.

# PSYCHROMETRIC CHART



## HRV INSTALLED WITH FORCED AIR SYSTEM



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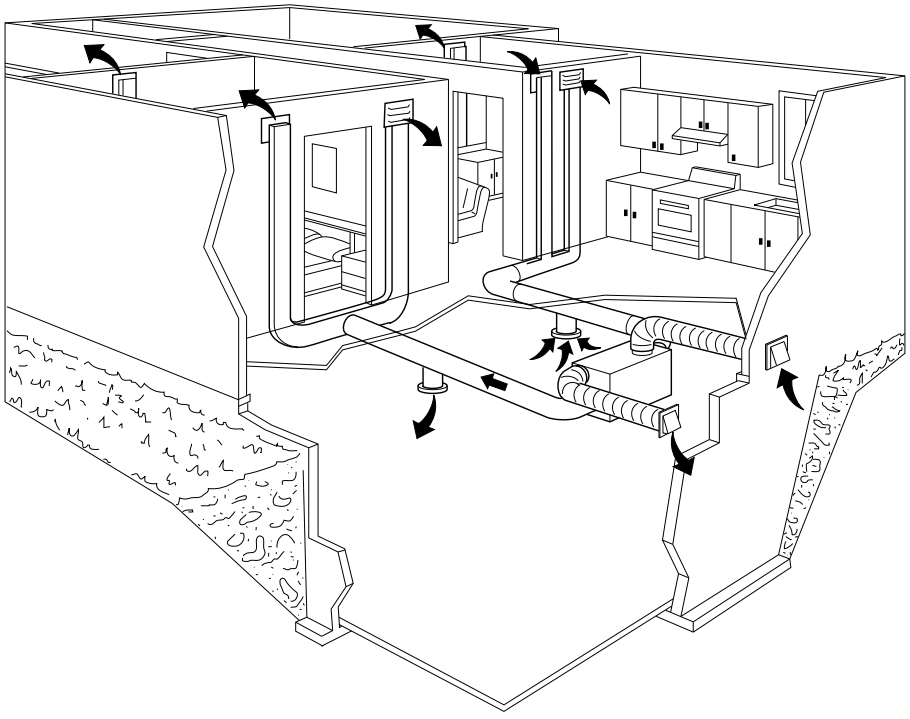
## HRV INSTALLED WITH INDEPENDENT AIR DISTRIBUTION



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Heating & Cooling Systems

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

UNIT MUST BE INSTALLED IN ACCORDANCE
WITH INSTALLATION INSTRUCTIONS

Cancels: PDS VA3B.15.1B

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